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ABSTRACT

A Technology in Education III (TIE-3) grant was awarded to the C-SMART Consortium Project for the 1999-2000 school year by the Texas Education Agency (TEA). The consortium consisted of seven public and private schools in Texas. The goal of this grant was to accomplish four main objectives: electronic activities for development of student problem-solving skills; video conferencing of Spanish I to rural school districts who were unable to provide a Spanish course to their students; a variety of professional development experiences designed to enhance teacher technological literacy as well as teacher ability to incorporate technology with course content; and opportunity for adult literacy training through the use of computer-based programs to parents, open access labs to parents, and technology training to parents. The purpose of the C-SMART TIE-3 grant evaluation written for TEA was to: determine the degree and quality of the implementation of the project using both qualitative and quantitative research methods; provide formative and summative evaluation of the project in order to facilitate concurrent and future decision making for the TIE-3 grant; and meet the requirements of the TEA for evaluation of the project. Participants included nearly 10,500 students, 750 teachers and 17 district technology facilitators who comprised C-SMART's Leadership Team. From the data gathered in the evaluation, the following assumptions about C-SMART's impact on its participants are construed: computer usage in the integration of content with instruction was greatly enhanced by the C-SMART program; time spent on daily managerial, research, and planning tasks is perceived by participants to be reduced with the use of the computer; students use the computer as a tool for seeking information for their class work with more frequency and confidence; and teachers are more comfortable with using the computer for classroom instruction. The Technology Questionnaire and pre- and post-Technology Questionnaire results are appended. (AEF)

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Leadership, Technology, and Student Learning

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Leadership, Technology, and Student Learning

Computer technology has revolutionized many aspects of our lives over the last fifty years. Technological advances have been remarkable. The storage, retrieval, and management of information by the computer has changed the way individuals do business, communicate, and entertain themselves (Manheimer, Snodgrass, & Moskow-McKenzie, 1995), but how has computer technology impacted the educational community? Computer technology integration in the classroom has become more common place due to the foresight of many of today's educational facilitators. The intent of this study was to examine educational facilitators' roles in learning and promoting technology and its impact on student learning.

A Technology in Education III (TIE-3) grant was awarded to the C-SMART Consortium Project for the 1999-2000 school year by the Texas Education Agency (TEA). The consortium consisted of the following public and private schools in Texas: College Station ISD, Snook ISD, Madisonville ISD, Allen Academy, Alta Vista Christian Academy, Richards ISD, and St. Thomas Early Learning Center. The goal of this grant was to accomplish four major objectives: (1) electronic activities for development of student problem-solving skills; (2) video conferencing of Spanish I to rural school districts who were unable to provide a Spanish course to their students; (3) a variety of professional development experiences designed to enhance teacher technological literacy as well as teacher ability to incorporate technology with course content; and (4) opportunity for adult literacy training through the use of computer-based programs to parents, open access labs to parents, and technology training to parents. The Principals' Center at Texas A&M University was contracted to write the C-SMART Consortium's

grant evaluation for TEA. The purpose of the C-SMART (TIE-3) grant evaluation was to: (1) determine the degree and quality of the implementation of the project using both qualitative and quantitative research methods; (2) provide formative and summative evaluation of the project in order to facilitate concurrent and future decision making for the TIE-3 grant; (3) meet the requirements of the Texas Education Agency for evaluation of the project.

Method

Participants

Participants for this study included nearly 750 teachers, 10,500 students, and 17 district technology facilitators who comprised C-SMART's Leadership Team. According to Linda Ray, C-SMART Project Director, this project served many students from lower socioeconomic backgrounds with higher-level thinking skills scoring 20 to 30 percent below their peers on standardized achievement tests.

C-SMART served "at-risk" and economically disadvantaged students in the following rural school districts: Madisonville ISD (58.2% low SES); Richards ISD (52% low SES); Snook ISD (59% low SES), and; College Station ISD (25.3% low SES). Students were predominantly Caucasian followed by African American and Hispanic students.

Data Sources

For a complete picture of how the TIE- 3 project impacted participants in the C-SMART consortium, The Principals' Center evaluation team used: (1) comments collected and summarized from teacher log on technology surveys; (2) pre and post technology use surveys; (3) interviews with participating school district facilitators; and (4) notes from monthly C-SMART meetings. This variety of collected data, gave a thick description of the TIE-3 project and its effect on participants and participating schools.

Using action research methods as prescribed by Argyris & Schön (1974), and Erlandson, Harris, Skipper, & Allen (1993), plus descriptive and statistical data, the Center was able to derive some important themes and insights into how participants were impacted by the TIE-3 project training.

Data Collection and Analysis

First, an assessment of teachers' attitudes toward technology in instruction was completed. This pre-survey was in the form of a Technology Questionnaire. Teachers were asked to rate their responses regarding the implementation of technology instruction. Teachers completed these pre-surveys. Surveys were collected and analyzed by the Principals' Center. At the end of year one of the TIE-3 grant, teachers completed a post-survey. They were asked to estimate how frequently they used technology in school related tasks with students. The post-survey Technology Questionnaire was identical to the pre-survey instrument administered by the Principals' Center to the C-SMART teachers. Analysis of the Technology Questionnaire included descriptive statistics and t-test analysis. See Appendix for graphic results.

Qualitative data sources included monthly meetings, interviews, and written reflections from teachers. The Principals' Center attended monthly meetings and gathered information regarding participating districts' successes and concerns in the implementation of technology as well as the goals of the C-SMART Consortium Project. Principals' Center employees conducted interviews (See Appendix for interview questions) with the project facilitators and collected information from teacher reflections. The purpose of the interviews and collection of written reflections was to complement the information obtained through the Technology Questionnaire. Teacher reflections were obtained through a comment section on the Technology Questionnaire. Qualitative data

analysis was used to categorize themes and make judgements about the data obtained from monthly meetings, interviews, and teachers' written reflections.

Results

From data gathered in the evaluation, the following assumptions about C-SMART's impact on its participants can be construed:

1) Computer usage in the integration of content with instruction was greatly enhanced by the C-SMART program. This assumption can be supported by accumulated data that included pre-survey and post-survey results, and school district facilitator interviews.
2) Time spent on daily managerial, research, and planning tasks is perceived by participants to be reduced with the use of the computer. This assumption is supported by accumulated data that indicates teachers' increased their usage of the computer for recording grades, writing lesson plans, and researching information for instruction.
3) Students use the computer as a tool for seeking information for their class work with more frequency and confidence. This assumption is supported by accumulated data that indicates frequency of computer usage to be significantly and progressively greater in student search for information on the Internet.
4) Teachers are more comfortable with using the computer for classroom instruction. This assumption is supported by accumulated data that indicates C-SMART teachers are comfortable with computer usage.

Discussion

Participating schools in the C-SMART consortium were positively affected in the following ways:

1) Participants learned how to work with a variety of educational settings and perspectives to achieve a common goal, technology integration and training for teachers;
2) Participants found ways to share resources to benefit the individual needs of their respective schools. An example is the benefit Richards ISD received through distance education networking with College Station ISD. Thanks to a collaborative partnership Richards ISD can now offer Spanish I to its students by way of distance education networking with A & M Consolidated Middle School (A&M Junior High). A common problem with small rural schools is filling needed teaching positions. College Station ISD wanted to expand its distance education capabilities. Richards ISD needed a Spanish I teacher. Both districts benefited from the partnership. The TIE-3 grant helped the C-SMART consortium meet the needs of both school districts;
3) Participating schools were able to offer "just-in-time" training and mentorship using a train-the-trainer model developed by College Station ISD;
4) Participants were able to provide teacher workstations to improve teacher efficiency and effectiveness. This decreased teacher isolation from other professionals and improved teacher moral;
5) Participants were able to provide access by staff and students to the best available electronic information resources in classrooms, libraries, and other appropriate sites through the purchase of lap top and desk top computers;
6) Due to a successful first year in the C-SMART consortium, participants pursued continued funding for their new collaborative. The consortium wished to offer more training in technology usage as well as more advanced technology integration training to their participants.

References

Argyris, C., & Schön, D. (1974). *Theory in practice: increasing professional effectiveness.* San Francisco: Jossey-Bass Publishers.

Erlandson, D., Harris, E., Skipper, R., & Allen, A. (1993). *Doing naturalistic inquiry: a guide to methods.* Newbury Park, CA: Sage.

Manheimer, R. J., Snodgrass, D. D., & Moskow-McKenzie, D. (1995). *Older adult education.* Connecticut: Greenwood Press.

Appendix

Technology Questionnaire

Please help us in our effort to address technology issues by answering the following questions. Rate your responses using a scale from 1 to 5, with 5 representing always and 1 representing never. Shade in the circle that best fits your response.

Personal ID Number

School ID Number

Grade Level

K 1 2 3 4 5 6 7 8 9 10 11 12

	Never 1	2	Sometimes 3	4	Always 5
[illegible]	○	○	○	○	○
2. I use the overhead projector for classroom instruction.	○	○	○	○	○
[illegible]	○	○	○	○	○
4. I use the computer for writing lesson plans.	○	○	○	○	○
[illegible]	○	○	○	○	○
6. Students use the computer daily.	○	○	○	○	○
[illegible]	○	○	○	○	○
8. Students use the computer for graded assignments.	○	○	○	○	○
[illegible]	○	○	○	○	○
10. My students are comfortable using the computer.	○	○	○	○	○
[illegible]	○	○	○	○	○
12. I feel comfortable using a computer for classroom instructions.	○	○	○	○	○
[illegible]	○	○	○	○	○

Comments.

Pre and Post Technology Questionnaire Results

There were a total of 195 respondents on the pre and post-surveys. The pre-survey was administered during project Kick-Off Sessions. The post-survey was distributed by the project facilitators in the month of August to participants. The deadline for submission was August 30, 2000. The deadline was extended to encourage participants to return the post-surveys. Surveys were received through October 1, 2000.

The following graphs show the pre and post mean comparisons for the entire C-SMART Consortium on each question of the Technology Questionnaire. The t-test analysis is described beneath each graph.

The overall response means for Figure 1 indicate a slight decrease in the amount of chalkboard use. At the .004 level, the t-test (t = .551) showed the difference between means not to be statistically significant (.582, 2-tailed significance).

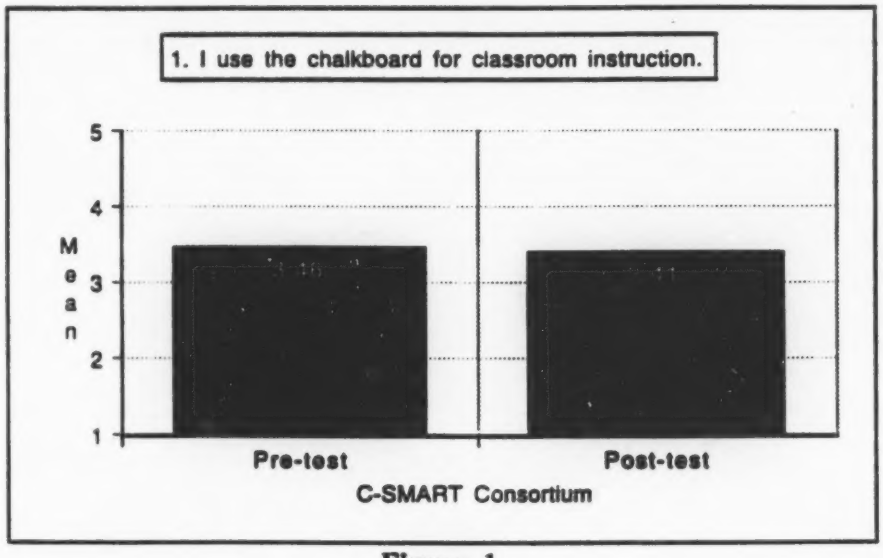

Figure 1

Figure 2 indicates there was no increase in the amount of overhead projector use in the classroom as reported by the pre and post-surveys. At the .004 level, the t-test (t = .075) showed the difference between means not to be statistically significant (.940, 2-tailed significance).

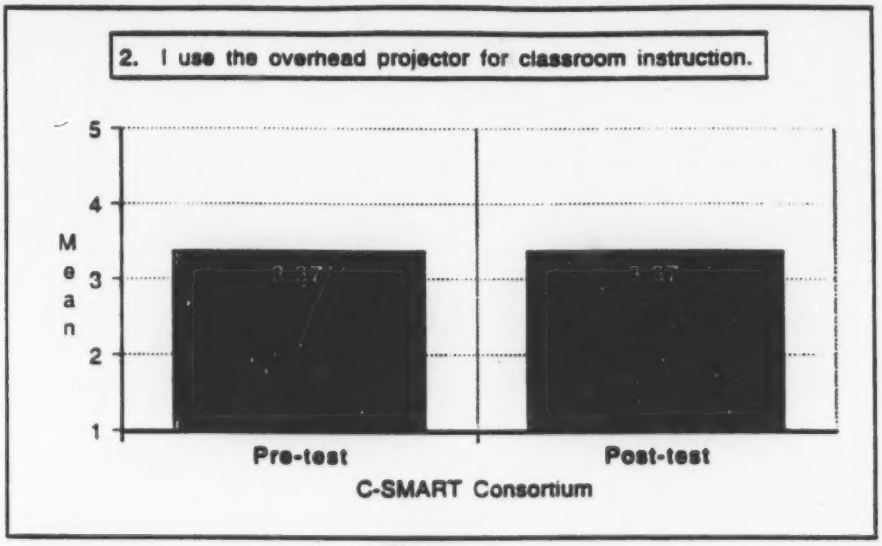

Figure 2

As seen in Figure 3, the overall response means for this item indicate a slight increase in the use of the computer for classroom instructions as reported on the pre and post-surveys. At the .004 level, the t-test (t = -.656) showed the difference between means not to be statistically significant (.513, 2-tailed significance).

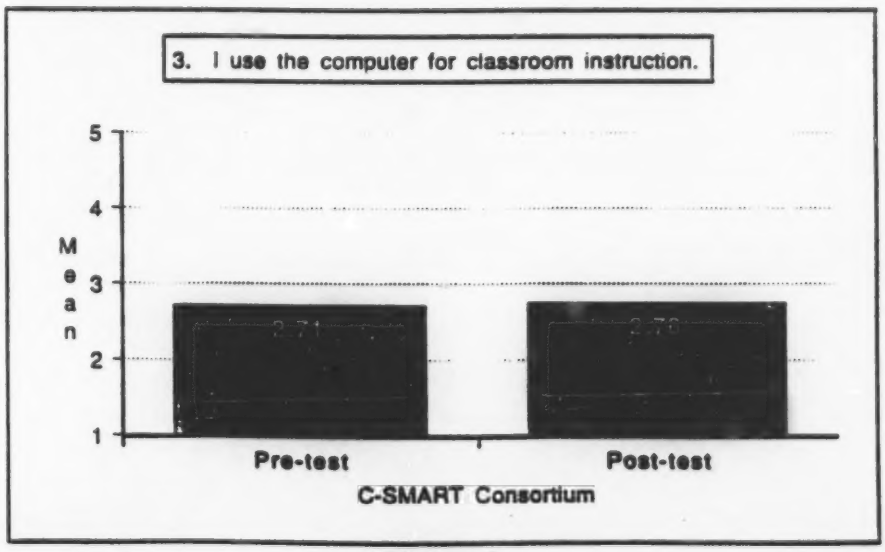

Figure 3

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Figure 4 shows the overall response means for this item indicate an increase in the use of the computer for writing lesson plans as reported by the pre and post-surveys. At the .004 level, the t-test (t = -3.366) showed the difference between means to be statistically significant (.001, 2-tailed significance).

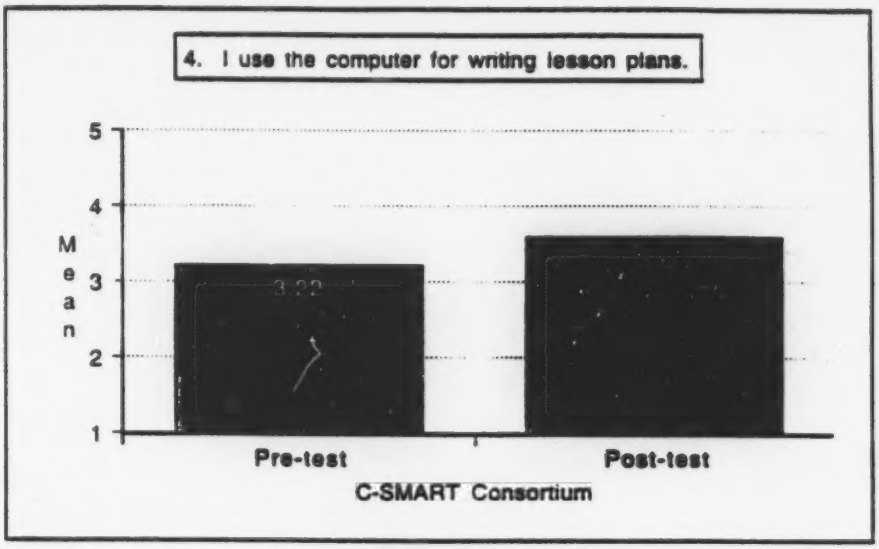

Figure 4

The overall response means for Figure 5 indicate an increase in the use of the computer for logging grades as reported by the pre and post-surveys. At the .004 level, the t-test (t = -2.791) showed the difference between means not to be statistically significant (.006, 2-tailed significance).

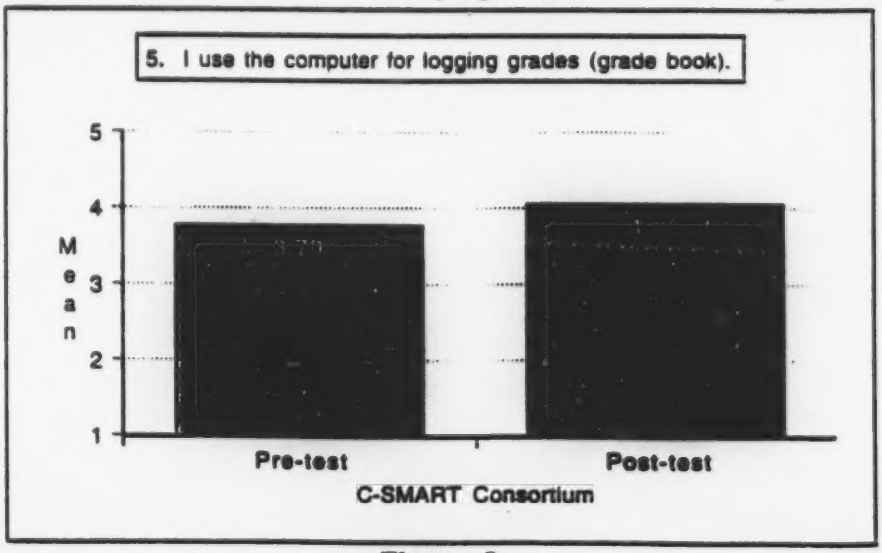

Figure 5

The response means for this item indicate an increase in the amount of daily computer use by students as reported on the pre and post-surveys. At the .004 level, the t-test (t = -2.012) showed the difference between means not to be statistically significant (.046, 2-tailed significance).

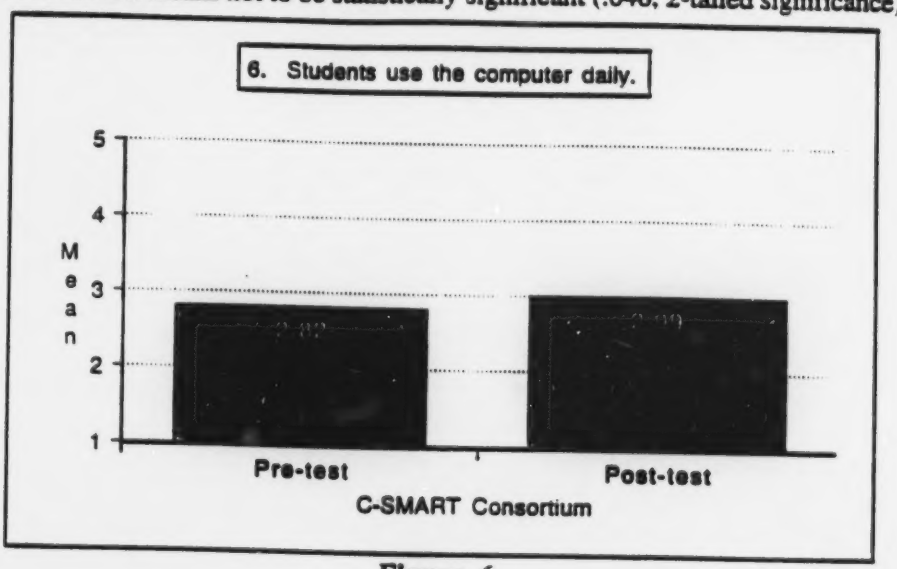

Figure 6

Figure 7 shows the overall response means for this item indicate an increase in the amount of student computer use for activities reported by the pre and post-survey results. At the .004 level, the t-test (t = -.634) shows the difference between means to not be statistically significant (.527, 2-tailed significance).

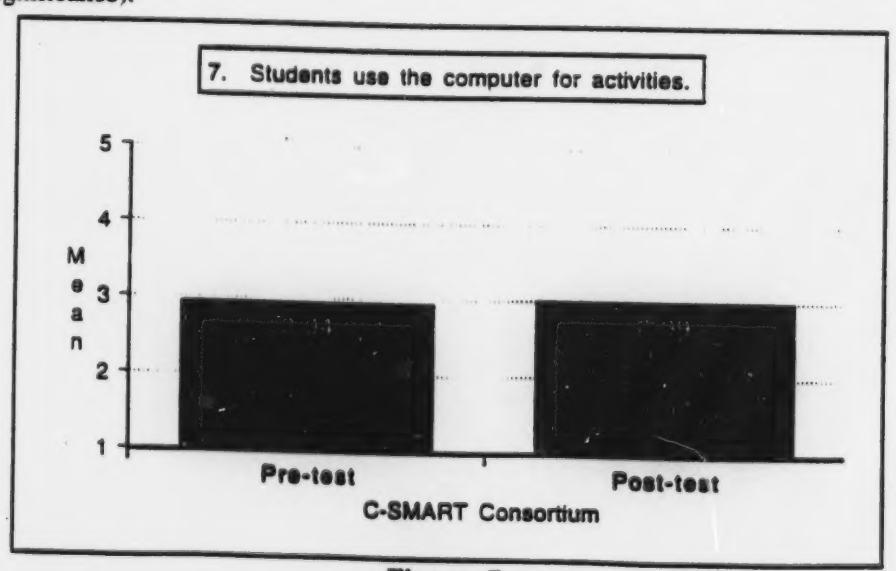

Figure 7

The overall response means for Figure 8 indicate a slight increase in the use of the computer by students for graded assignments as reported on the pre and post-surveys. At the .004 level, the t-test (t = -.762) showed the difference between means not to be statistically significant (.447, 2-tailed significance).

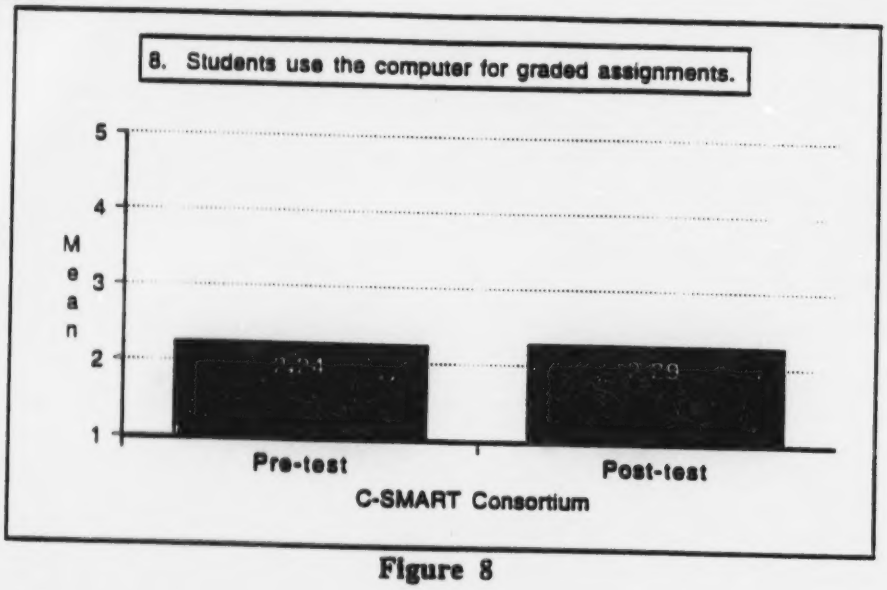

Figure 8

As Figure 9 presents, the overall response means indicate an increase in the amount of computer use for information searches as reported by the pre and post-surveys. At the .004 level, the t-test (-2.146) showed the difference between means to not be statistically significant (.033, 2-tailed significance).

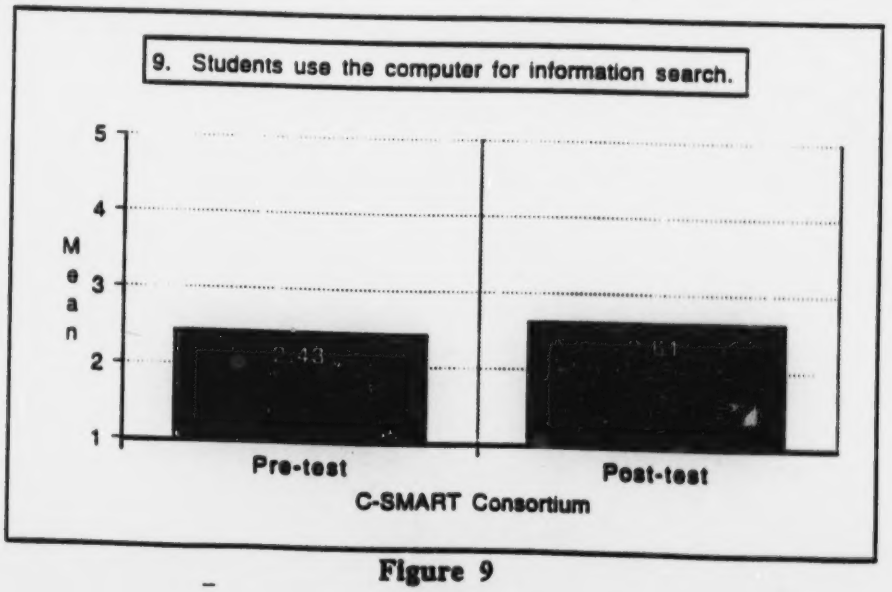

Figure 9

Figure 10 shows the overall response means to be a decrease in the students' comfort level when using the computer as reported on the pre and post-surveys. At the .004 level. the t-test (t = 10.63) showed the difference between means to be statistically significant (.000. 2-tailed significance).

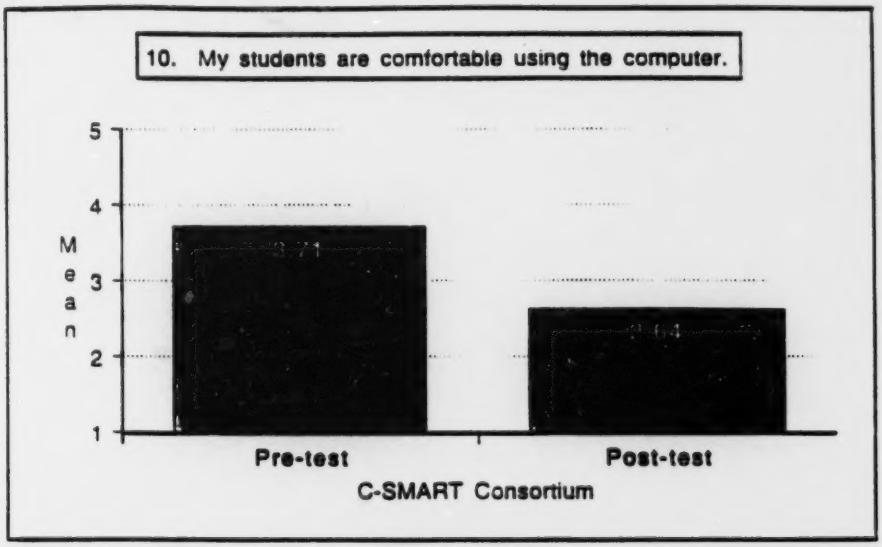

Figure 10

The overall response means for Figure 11 indicate a slight increase in teachers' comfort level when using the computer for personal uses as indicated on the pre and post-survey results. At the .004 level. the t-test (-1.822) showed the difference between means to not be statistically significant (.070. 2-tailed significance).

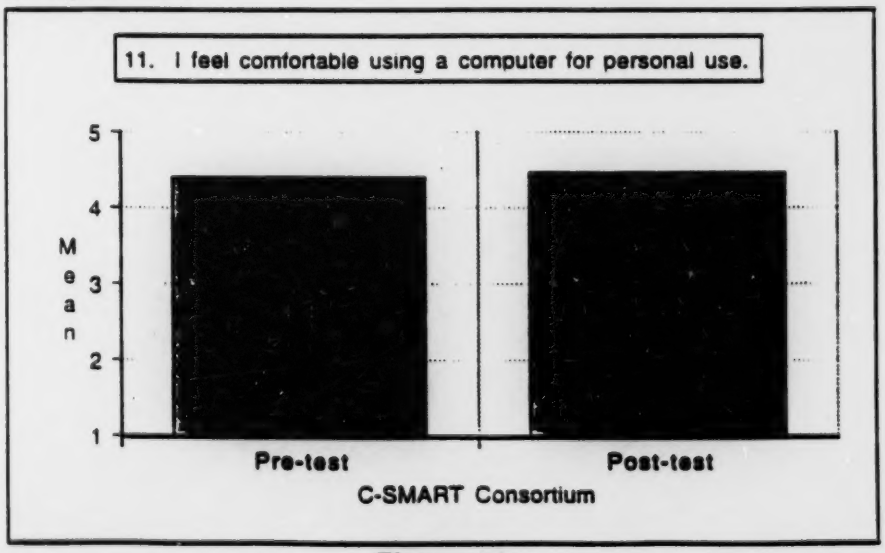

Figure 11

The overall response means for this item indicate an increase in the feeling of being comfortable to use the computer for classroom instructions as reported by the pre and post-surveys. At the .004 level, the t-test (t = -2.783) showed the difference not to be statistically significant (.006, 2-tailed significance).

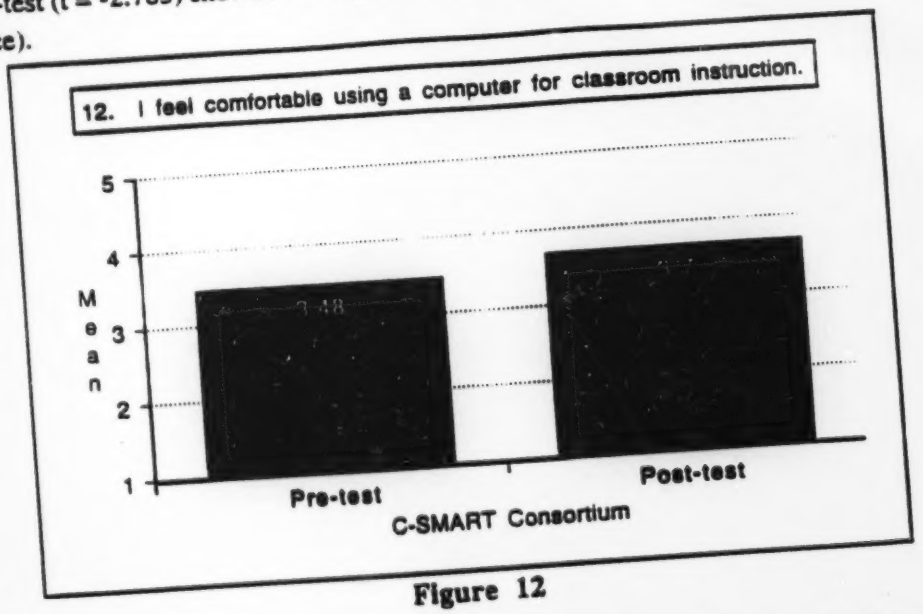

Figure 12

As reported by the pre and post-surveys, the overall response means illustrated in Figure 13 indicate an increase in the use of technology for students with special needs. At the .004 level, the t-test (-3.732) showed the difference between means to be statistically significant (.000, 2-tailed significance).

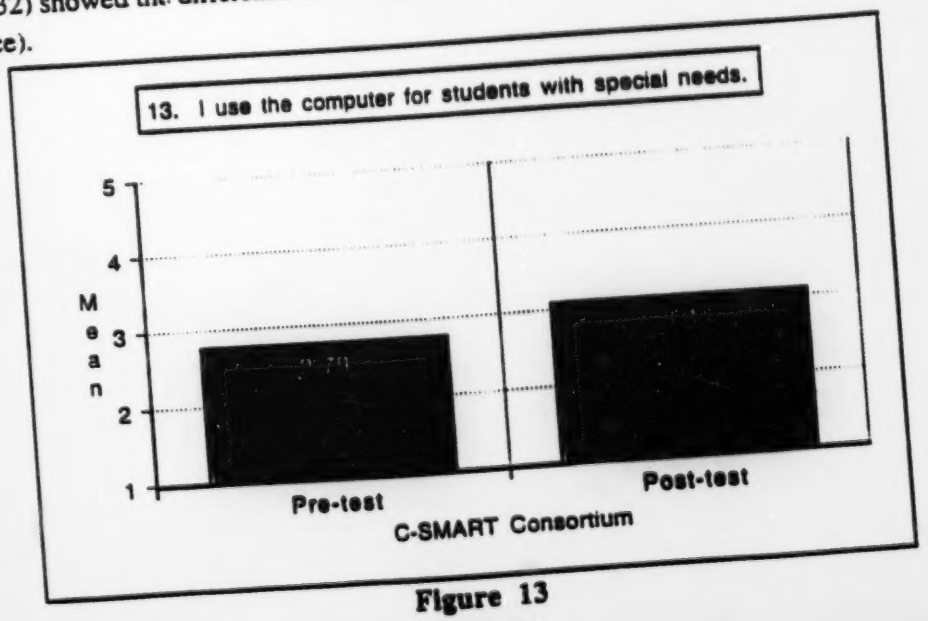

Figure 13

C-SMART INTERVIEWS

Your Texas A&M evaluation team is providing you the following questions and schedule for facilitator interviews. If there are other questions that you feel should be included in the interviews with C-SMART facilitators. please let us know. We will be glad to include them. Your input is vital to the program. The information gathered will help you and the TIE grant leadership plan "next steps" in the training and implementation of technology training for the collaborative. All interviews will be audio taped, but information will be considered confidential and anonymous. Individual facilitator interviews as well as group interviews will be held on 4/20/00.

Luana Zellner, Evaluation Team Coordinator
Principals' Center, Texas A&M University

C-SMART Meeting

9 a.m. Individual facilitator interviews
Individual facilitator interviews will be conducted by Cindy Brown and Luana Zellner. Each individual interview will not take more than 10 minutes.

10:30 Group interview
A group interview will take place. At this point the evaluation team will ask for feed back related to log comments submitted by teachers and general statements voiced by facilitators.

Individual Interview Questions:

1. **What are the positive aspects of being involved in the TIE grant?**
2. **How are most teachers using their computers? (i.e., administrative purposes, classroom instruction, student use).**
3. **Tell about those teachers that have made significant progress as a result of their participation in the TIE grant activities.**
4. **How often do you meet with teachers? Describe the conditions of the meetings.**
5. **How do you build on the successes?**
6. **What obstacles are you currently faced with? How are you overcoming them?**
7. **Which access strategy are you (facilitator with teachers) using the most (example: web, email, modules, other).**
8. **From your perspective, how much out-of-school use of computer technology are your teachers involved in? Do you think availability of lap top computers for check out would enhance their use of technology in the classroom?**
9. **In your opinion (as a facilitator), how has your district contributed to the C-SMART collaborative? What has been their contribution to building and supporting the collaborative?**
10. **Given where we are now, what needs to be done next?**
11. **What improvements/suggestions would you recommend if another school district wished to pursue a similar program/grant or if the TIE grant was extended another year?**
12. **What do you feel is your contribution to the collaborative?**
13. **When TIE grant monies run out, how does your district plan to continue the training and integration of technology?How will you get the district to**